PREPRODUCTION INITIATIVE
PORTAFOAMER AIRCRAFT CLEANING UNIT
TEST PLAN
Site: NAS Joint Reserve Base Willow Grove, PA

1.0 OBJECTIVE

This test plan describes the data collection procedure for evaluating the use of a Portafoamer Aircraft Cleaning Unit (PACU) in a Navy operational environment. The data will be used to determine the system's efficiency, effectiveness, and overall success with respect to cleaning aircraft. The environmental and cost benefits of mixing soap and water on demand versus the current method of using a premixed soap solution will be evaluated.

2.0 DESCRIPTION

Currently, aircraft surfaces are cleaned and maintained on a periodic schedule. Navy Regulations OPNAV 4790.2 and NAVAIR 01-1A-509 require the periodic cleaning of aircraft for corrosion protection. The current method of cleaning large aircraft involves premixing a solution of 1 gallon of soap to 10 gallons of cold water. The current foam-generating cleaning unit is then filled with the solution and generates soap foam to clean the aircraft surfaces. Navy personnel use brushes and rags to remove contaminants from the surface of the aircraft. When the cleaning task is completed, the tank is drained and flushed. The excess soap solution creates waste and added workload during the cleaning process.

To simplify this process and to reduce operator error and waste, the PACU will be evaluated. The unit consists of a 20-gallon soap tank; 100-gallon water tank with constant water feed; hot or cold pressure washer; foamer attachment using either shop air or atmospheric air; an electric, lockable chemical metering pump; cold water flushing unit; manual hose reel with dual 50-foot hoses; a diesel engine; direct drive pumps; and a boiler. The system delivers 2.5 gallons per minute (gpm) of hot (200°F) or cold fluid up to 175 pounds per square inch (psi)—the maximum limits permitted by NAVAIR 01-1A-509. The foamer requires shop air up to 100 psi or atmospheric air when used in the field and a water source to fill the water tank. The PACU allows soap and water to be mixed on demand to operator-selected portions. The system meters the soap into the water stream at the point of application. The PACU system is portable on a four-wheel towable frame and can also be used in conjunction with an existing wash rack.

3.0 TEST PLAN

This test plan will be used to evaluate the effectiveness of the H2.5D175TTM foaming unit manufactured by Sioux Steam Cleaner Corporation. Quantitative and qualitative data will be collected and used to evaluate the system's ability to enhance the efficiency and effectiveness of the current method and to verify environmental and cost benefits savings. Also evaluated will be the benefits of having hot water pressure and whether it will eliminate or reduce labor hours.

3.1 Approach

One PACU will be used during the implementation of this test plan. Quantitative and qualitative data will be collected by completion of the PACU Operator's Log Sheet and the PACU Monthly Maintenance and Repair Log Sheet.

3.1.1 Instructions for Completing the PACU Operator's Log Sheet (Table 1)

The PACU Operator's Log Sheet shall be filled out each time the PACU is used to clean an aircraft. The following information must be filled out on the data sheet.

3.1.2 General Information

- **Date:** Record the date on which the cleaning was performed.
- **Name:** Record the name of the person filling out the data sheet.
- **Number of Personnel Performing An Aircraft Cleaning:** Record the number of personnel performing the cleaning.
- **Type of Aircraft:** Record the type of aircraft being cleaned.
- **Aircraft Number:** Record the number of the aircraft.
- **Aircraft Paint Coating:** Record the type of paint the aircraft is coated with, e.g., flat or glossy.
- **Time:** Record the time the cleaning started and ended for each process completed.
- **Location:** Record where the cleaning occurred—in the field or at the wash rack.
- **Air source:** Record whether shop air or atmospheric air was used for the foamer.
- **Type of Soap:** Record the type of soap used to clean the aircraft.
- **Chemical Ratio:** Record the water-to-soap ratio used for cleaning.
- **Amount of Soap Used:** Record the gallons of soap used during the cleaning.
- **Amount of Water Used:** Record the gallons of water used during the cleaning.
- **Number of rags used:** Record the total number of rags used during the cleaning.
- **Preliminary Operating Procedures:** Check off the maintenance operation as the task is completed. If task was not completed, check off the corrective action taken and explain in the Comments section.
- **Operator Comments or Suggestions:** Provide any relevant comments regarding the performance of the PACU, particularly with regard to the unit's ease of use, effectiveness of the chemical ratio, and overall performance. If there are recommendations for improvement, please indicate.

3.3.a Instructions for Completing the Monthly Maintenance and Repair Log Sheet (Table 2)

The following data will be collected at least on a monthly basis.

- **Month**: Enter the month in which the maintenance/repair occurred.
- **Name**: Enter the name of the individual completing the log.
- **Maintenance Required**:

- **Total Time to Complete Action:** Record the amount of time required to perform the maintenance.
- **Maintenance Action:** Indicate the type of maintenance performed.

- **Repairs:** All repairs must be arranged through Geneen McQuaid, UTRS, Inc., or Dave Snow, NAVAIR Lakehurst, unless it is an emergency.
  - **Time:** Indicate the total time required to repair the system.
  - **Parts:** List the repair parts required.
  - **Description of Repair:** Describe what the repair involved.

- **Qualitative Assessment:** Provide a narrative evaluation of the PACU's capabilities. Briefly discuss the following:
  - Unit's efficiency and effectiveness
  - Ease-of-use and the unit's ability to successfully interface with site operations
  - Most effective air source to produce foam (i.e., shop air or atmospheric air)
  - Most effective chemical ratio
  - Additional information as required.

4.0 REPORTING

As previously described, the PACU Operator's Log Sheet will be completed each time the system is used, and the PACU Monthly Maintenance and Repair Sheet will be completed monthly. Data will be collected for one year. During the evaluation period, the data sheets will be faxed to Geneen McQuaid/David Snow (see Section 4.1, Points of Contact, for the fax number) monthly, at a minimum. The final report will include information on the system's overall performance, cost-effectiveness, safety, environmental and cost benefits, and ability to interface with site operations.

4.1 Points of Contact

If at any time during the test and evaluation period the equipment malfunctions or consumables or technical support is needed, please contact the assigned POC at UTRS and/or NAVAIR Lakehurst as listed below. Do not contact the vendor directly unless there is an emergency. Do not make any repairs to the equipment yourself as this may invalidate warranties. Please discuss any ideas you may have regarding equipment modifications or improvements with NAVAIR Lakehurst or UTRS. Do not discuss your ideas with the vendor as contractual problems may arise. NAVAIR Lakehurst and UTRS will arrange and procure all reasonable orders for consumables and repairs as soon as possible to ensure minimal impact to your site's operations. Please keep in mind that regular communication with NAVAIR Lakehurst and UTRS, and regular submittal of your data sheets are both vital to the success of this technology demonstration.

POC	Affiliation	Phone No.	Fax No.
Geneen McQuaid	UTRS, Cherry Hill, NJ	(856) 667-6770	(856) 667-7586
David Snow	NAVAIR, Lakehurst, NJ	(732) 323-2863	(732) 323-4810

Table 1
Portafoamer Aircraft Cleaning Unit
Operator's Log Sheet

Date: _____

Name:_____

Number of personnel performing an aircraft cleaning:_____

Type of Aircraft:_____

Aircraft Number:_____

Aircraft Paint Coating:_____

Process	**Time**	
	Start	**Finish**
Setup		
Cleaning		
Breakdown		

Location (circle one): Field Wash Rack
Air Source (circle one): Shop Atmoshperic
Type of Soap:_____
Amount of Soap Used (Gallons):_____
Chemical Ratio (Parts water, Parts Soap):_____
Amount of Water Used (Gallons):_____
Number of Rags Used:_____

Preliminary Operating Procedures

Maintenance Operation	**Complete**	**Corrective Action Taken**
Inspect gun and wash tip to clear any obstructions		
Check oil level. Maintain level at inspection plug on water pump		
Check hose and fittings for leaks		
Inspect water filters to ensure they are not plugged		

Operator Comments or Suggestions: _____
_____
_____
_____

Fax to: Dave Snow, (732) 323-4810 or (DSN 624-4810) and Geneen McQuaid, (856) 667-7586.

Table 2
Monthly Maintenance and Repair Log Sheet

Month:_____
Name: _____

Maintenance

Did you need to perform any maintenance on the PACU? Yes ☐ No ☐

Total Time to Complete Action	Maintenance Action

Repairs
Please contact Dave Snow (732-323-4810) or Geneen McQuaid (856-667-6770) before performing repairs—unless it is an emergency. *

Time	Parts	Description of Repair

Qualitative Assessment: Briefly discuss the following:

- Unit's efficiency and effectiveness
- Ease-of-use and ability to successfully interface with site operations
- Most effective air source to produce foam (i.e., shop air or atmospheric air)
- Most effective chemical ratio
- Additional information as required.

_____
_____
_____
_____
_____
_____
_____

*Attach additional sheets as needed

Fax to: Dave Snow at (732) 323-4810 or (DSN 624-4810) and Geneen McQuaid at (856) 667-7586